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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/497,499	02/04/2000	Kazuhiko Asakawa	OKI.147	7562

7590

02/12/2003

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EXAMINER

LOUIE, WAI SING

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 02/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/497,499

Applicant(s)

ASAKAWA ET AL.

Examiner

Wai-Sing Louie

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 20 is objected to because of the following informalities:

- The dependency of claim 20 is incorrect, i.e. claim 20 cannot be depended on claim 20.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe (US 5,808,363) in view of Isobe (US 5,716,872).

With regard to claims 10, 13, and 19, Watanabe discloses a semiconductor device (col. 4, line 22 to col. 6, line 15 and fig. 5 and 6) comprising:

- A semiconductor substrate 1 has first and second regions formed on a major surface;
- A first insulating layer 4, which is formed over the first region;
- A dummy pattern 5X, which has a predetermined shape, and which is formed on the first insulating layer 4;

- A first SOG layer 7, which is formed on the side surface of the dummy pattern and the first insulating layer 4;
- A second insulating layer 10, which is formed on the second insulating layer 8;
- The first and second insulating layer and first and second SOG layer are exposed at the boundary between the first region and second region (fig. 5);
- Watanabe disclose an insulating layer 8 deposited on the SOG film 7, but does not disclose the second layer formed on the top surface of the dummy pattern is SOG. However, Watanabe teach the insulating film may be made of any insulative material, but is preferably made of SOG (col. 3, lines 1-2). Therefore, it is obvious the insulating layer 8 could be made of SOG.

Watanabe does not disclose the second SOG layer 8 is denser than the first SOG film 7. However, Isobe teaches that there are a large number of uncoupled bonds in the SOG film. The exposed SOG film tends to absorb moisture (col. 2, lines 21-22 and col. 5, lines 21-23). Ion irradiation on the surface could couple these uncoupled bonds and densified the SOG surface (col. 5, lines 23-26) and this would improve reliability of the SOG film (col. 5, line 29). Therefore, it would have been obvious at the time the invention was made to modify Watanabe's device with the teaching of Isobe to densify the second SOG layer in order to prevent moisture absorption and reliability of the SOG film.

With regard to claim 11, Watanabe disclose the second region 5 is a grid line (fig. 5).

With regard to claims 12 and 14, Watanabe disclose a fuse element 3, which is formed over the second region (fig. 5).

With regard to claims 15 and 16, Watanabe does not disclose the second SOG layer includes ion such as argon, fluorine, nitrogen, Group IIIb to VIIb, and Group IVa to Va elements. However, Watanabe modified by Isobe, in claim 10 above, would use Ar⁺ ion irradiation to densify the top or exposed surfaces of second SOG layer 8. Isobe also discloses fluorine material may be used (col. 6, lines 57-64).

With regard to claims 17-18 and 22, Watanabe discloses the fuse element 3 is a laser blown fuse element (col. 5, lines 16-18).

With regard to claim 20, Watanabe do not disclose the device is a DRAM memory device. However, Watanabe's device is an interconnection device, which is identical to the present application (fig. 6a and present application fig. 3c). Therefore, Watanabe's device could be used in a DRAM memory device.

With regard to claim 21, Watanabe discloses the device comprising a redundant circuit having a redundant memory cell comprising a plurality of laser blown fuses (col. 2, lines 5-7 and lines 63-67).

Response to Arguments

Applicant's arguments filed 12/4/02 have been fully considered but they are not persuasive.

- Applicant argues that Watanabe does not disclose the second SOG layer. The insulation layer 8 is made of plasma oxide film. However, Watanabe teaches the

insulating film may be made of any insulative material, but is preferably made of SOG (col. 3, lines 1-2). Therefore, the insulation layer 8 could be SOG.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wai-Sing Louie whose telephone number is (703) 305-0474. The examiner can normally be reached on 7:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the

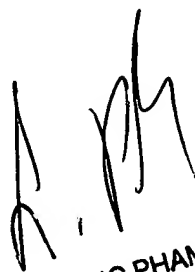
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organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

wsl

February 6, 2003


LONG PHAM
PRIMARY EXAMINER